S. LAKE.

SUBMARINE VESSEL.

APPLICATION FILED NOV. 16, 1907.

926,065. Patented June 22, 1909.

3 SHEETS—SHEET 1.

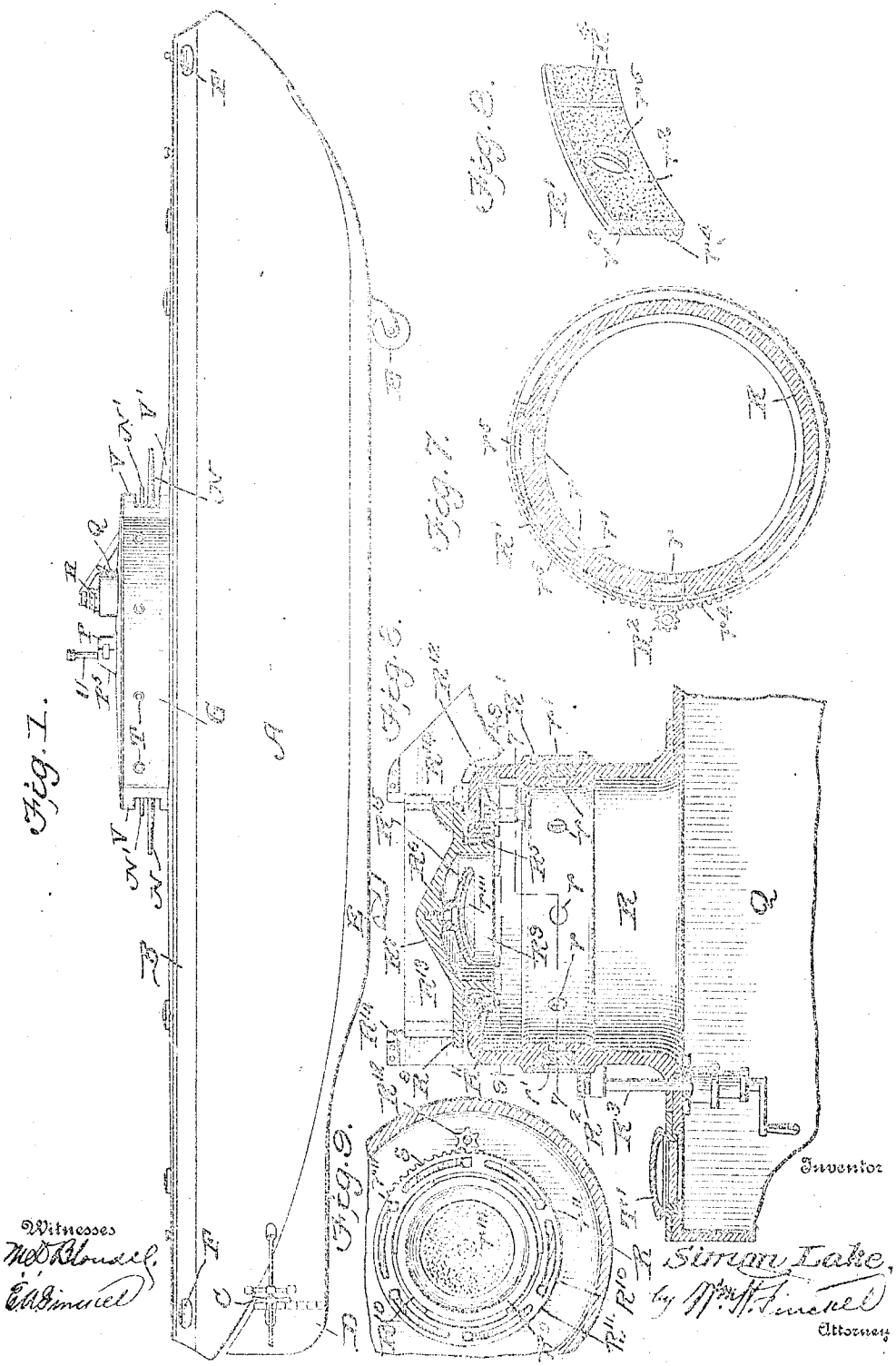


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Witnesses
M. C. Bonnell
E. A. Bonnell

Inventor
Simon Lake,
by Wm. H. Bonnell
Attorney

S. LAKE.

SUBMARINE VESSEL.

APPLICATION FILED NOV. 13, 1907.

926,065. Patented June 22, 1909.

3 SHEETS—SHEET 2.

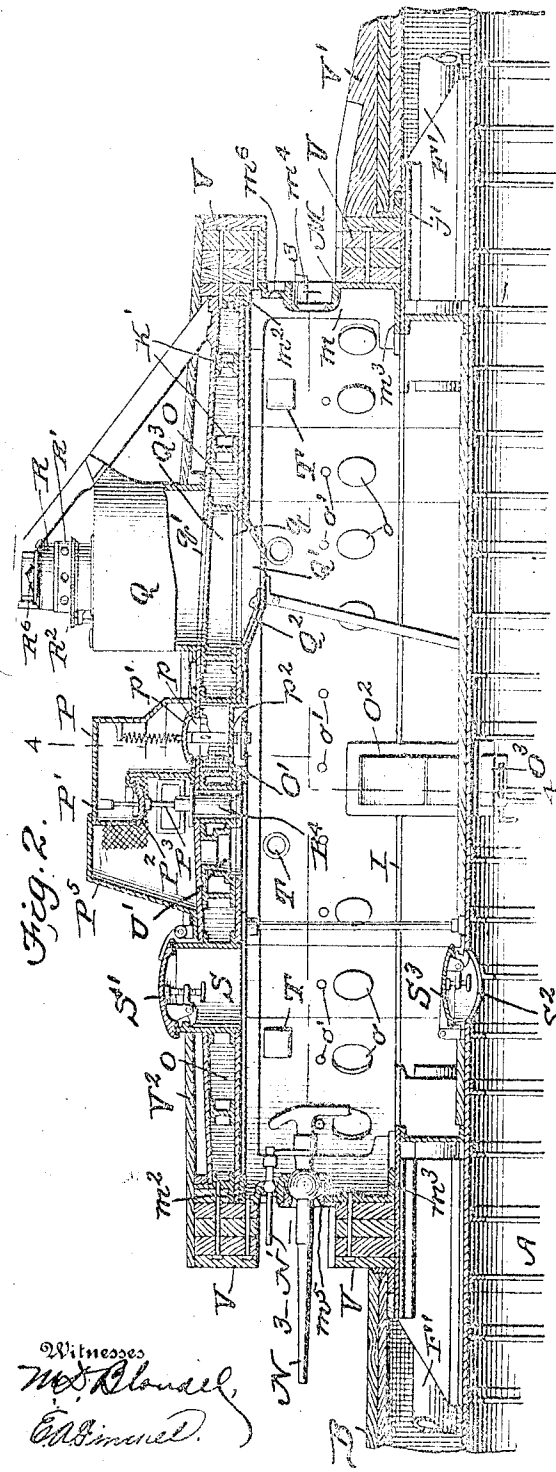


Fig. 2.

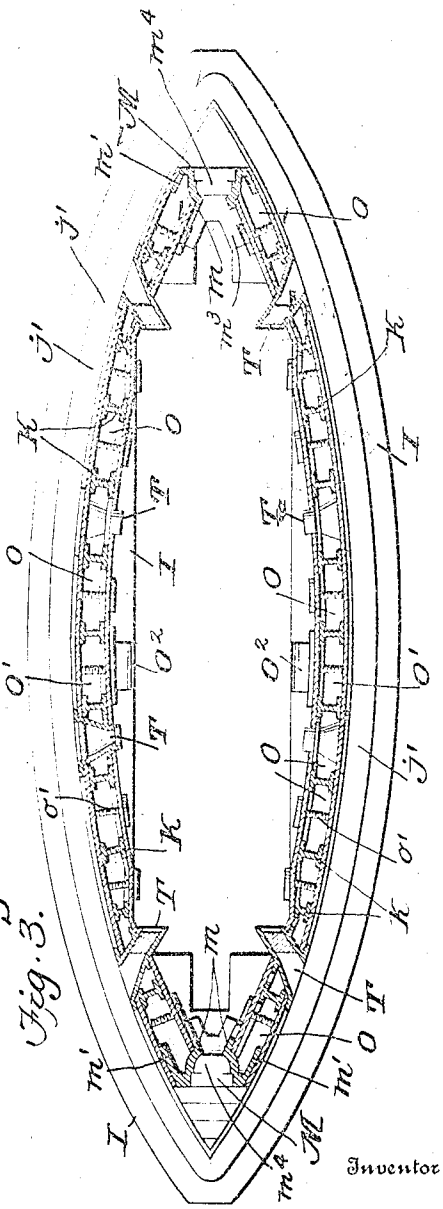


Fig. 3.

Witnesses

Inventor

Simon Lake.

by

Attorney

S. LAKE.

SUBMARINE VESSEL.

APPLICATION FILED NOV. 13, 1907.

926,065. Patented June 22, 1909.

3 SHEETS—SHEET 3.

Fig. 4

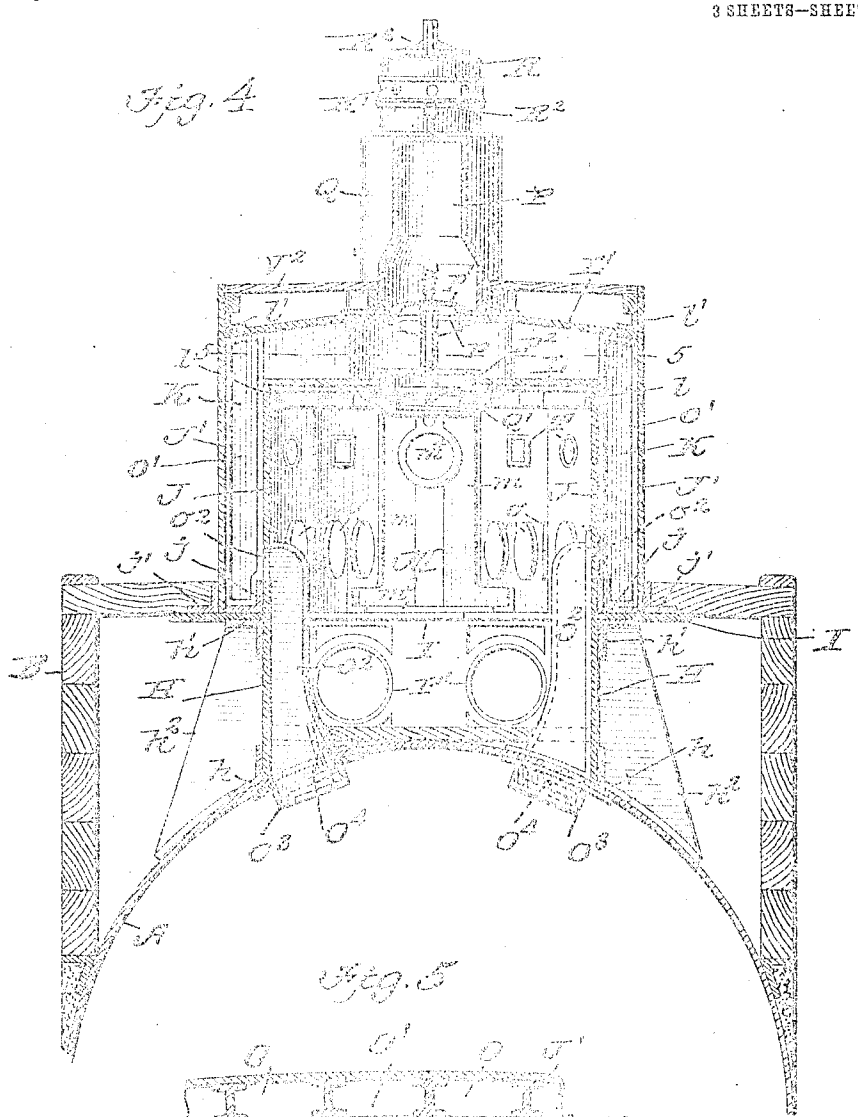
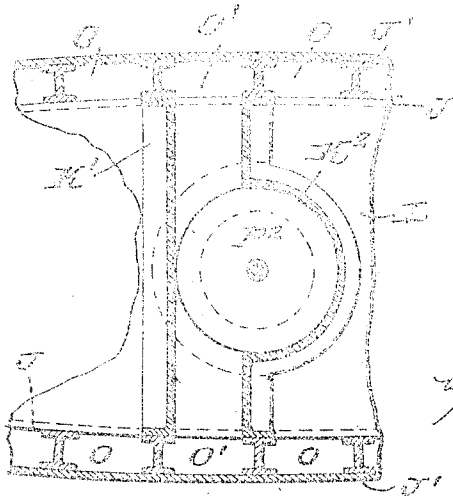


Fig. 5



Witnesses

Inventor

Simon Lake.

by Wm. A. Simonds

Attorney

UNITED STATES PATENT OFFICE.

SIMON LAKE, OF BRIDGEPORT, CONNECTICUT.

SUBMARINE VESSEL.

No. 926,065. Specification of Letters Patent. Patented June 22, 1909.

Original application filed June 4, 1907, Serial No. 377,135. Divided and this application filed November 13, 1907. Serial No. 402,024.

To all whom it may concern:

Be it known that I, SIMON LAKE, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, temporarily residing in London, England, have invented a certain new and useful Improvement in Submarine Vessels, of which the following is a specification.

This application is a division of an application filed by me June 4th, 1907. Serial No. 377,135.

The present invention has for its object an improvement in that class of submarine or submergible vessels intended for war purposes and relates particularly to improvements in the construction and arrangement of a navigating turret which is adapted for carrying rapid fire guns as part of the armament of such vessels, which adapts the vessel for surface operations as a harbor and coast defense cruiser, as well as a submarine vessel.

To this end the invention consists in constructing the vessel with a turret of sufficient strength to resist and withstand the contact of small shot of the rapid fire guns usually carried by all war vessels, and providing guns for offensive and defensive use for the purpose of warding off or resisting the attack of small craft that would otherwise be able to approach within striking distance and injure the vessel while performing the mission assigned to it.

The invention further consists in the peculiar construction of the turret, the arrangement of the guns, the employment of means for preventing rapid ingress of water to the turret and hull of the vessel in the event of the turret being pierced or otherwise injured; the utilization of the turret as an air duct for conducting fresh air to the interior of the vessel when the latter is operating upon the surface when the hatches leading to the hull are closed and with only the turret and sighting hood exposed above the surface of the water, and its adaptation as a ballast or storage compartment to give additional stability to the vessel when running completely submerged.

The invention also consists in the peculiar construction of the sighting hood projecting from the turret and by which observations may be made when the vessel is operating upon the surface and at times when the sighting instrument and the usual look-out openings would be ineffective.

The invention also comprises certain details of construction and arrangement of parts as will be hereinafter described and claimed.

In the drawings: Figure 1 is a side elevation of the entire vessel. Fig. 2 is a longitudinal section on an enlarged scale drawn through the navigating turret, one of the guns being removed. Fig. 3 is a horizontal section drawn through the navigating turret on the line 3—3 of Fig. 2, both guns being removed. Fig. 4 is a vertical cross section drawn on an enlarged scale through the navigating turret and part of the hull of the vessel on the line 4—4 of Fig. 2. Fig. 5 is a detail horizontal section drawn on the line 5—5 of Fig. 4. Fig. 6 is a longitudinal section drawn on an enlarged scale through the sighting hood. Fig. 7 is a horizontal section drawn on the line 7—7 of Fig. 6. Fig. 8 is a perspective view of a portion of the encircling band carried by the sighting hood. Fig. 9 is a detail horizontal section drawn on the line 9—9 of Fig. 6 looking in the direction indicated by the arrows.

The hull A, of the vessel is shown with a superstructure B, propellers C, a rudder D, bearing wheels E, torpedo discharge tubes F, and torpedo storage tubes F^1.

Projecting from the top of the hull of the vessel and extending through the superstructure B, is the navigating turret G, double conoidal shape in horizontal longitudinal section and preferably disposed directly over the centers of buoyancy and gravity of the vessel.

The sides of the turret are preferably constructed of plates, which I shall hereinafter refer to as walls. The lower walls H are connected at their lower longitudinal edges to the hull of the vessel by angle bars h, h, and at their upper edges by similar bars h', h', to a horizontally disposed stringer plate I, whose outer edges extend some distance from the walls H, and project under the inner edges of the superstructure B. Suitable buttresses h^2, h^2, are interposed between the walls H, the angle bars h and h', and the hull of the vessel.

To the upper face of the stringer plate are

secured angle bars j, j, to which are connected plates J, J, which form the inner walls of the upper part of the turret and that part thereof which projects above the superstructure. The inner walls are arranged in vertical alinement with the walls H. Adjacent to the angle bars j, are similar bars j', j', also securely fastened to the stringer plate and to these latter angle bars are connected plates J', J', which form the outer walls of the turret and are of a greater height than the walls J, for the purpose presently stated. The walls J, and J', are braced and held apart by angle bars, or I beams K, K, which are securely fastened to the said walls to provide air tight joints. The stringer plate is provided with an elongated opening that extends practically the full length of the turret.

M, M, designate castings which form the front and rear ends of the turret and each is constructed with vertical flanges m and m' to which the inner and outer walls J and J' respectively of the turret are connected. At their upper and lower edges the castings are constructed with horizontal flanges m^2 and m^3, respectively, the latter resting upon and secured to the stringer plate. Each casting is formed with a semi-circular socket m^4, in each of which is held a rapid fire gun N, the latter having spherical shaped enlargements on their barrels which snugly fit the sockets and are held therein by glands m^5. These glands also prevent ingress of water to the turret at these points when the vessel is submerged. Immediately above the gun sockets the castings are provided with smaller sockets m^6, in which are centered sighting instruments N', which are connected to and move in unison with the guns. Gland rings are also arranged around the instruments to seal the openings air and water-tight.

To the upper edges of the walls J are secured angle bars l, l, which extend nearly the entire length of the walls and have their ends abutting against the flanges of the end castings M, M, and to these bars is secured a plate L, which forms the inner top of the turret. Upon the plate are securely fastened angle bars or I beams K', K', Fig. 2 whose ends fit against and form practically a continuation of the vertical bars or beams K, and upon the bars or beams K', rests a plate L', which forms the outer top of the turret, the outer edges of the plate being secured to the outer walls J', J' of the turret by angle plates l', l', which are secured to the said outer walls adjacent to the upper edges thereof, and all of the joints are sealed air- and water-tight. This arrangement provides a series of air and water tight compartments O, O, between the side walls and within the top at the forward and rear ends of the turret. Access to the said compartments may be had through hand-holes arranged in and adjacent to the lower ends of the walls J, which are normally closed by plates o, o.

o', o', designate strengthening bolts which connect the walls J, and J', immediately above the hand-holes. The compartments O, may be utilized as ballast or storage tanks or for the reception of a suitable filling such as cellulose, pitch or the like, which will serve the known purpose of closing small openings or rents which might be made in the turret, especially when the vessel is operating upon the surface and thus prevent a too rapid ingress of water when the vessel is submerged, until a suitable stopper or plug could be installed over the opening.

By constructing the turret of inner and outer plates and bracing said plates as described, I not only provide a series of compartments which might be utilized for various purposes, but also provide a construction of very light weight and that is strong and durable, and it will be readily seen that should any one of the compartments be penetrated, the others will remain intact and therefore the danger of the whole turret being incapacitated or flooded is greatly reduced.

One of the compartments, O', near the center of the turret, is utilized as an air duct for conducting fresh air to the interior of the vessel when the latter is running upon, or immediately adjacent to the surface with only the turret above the water, and this compartment communicates with an air inlet hood P, through an opening p', formed in the top plate of the turret, and which is controlled by a valve p', the stem of which extends through a casting p^2, held over an opening formed in the inner plate of the top of the turret and has a hand wheel upon the extreme lower end by which the position of the valve is controlled. A cross beam K², Fig. 5, extending across the top of the turret adjacent to the valve p^2, is bowed outwardly and extended around the valve opening so as to make an uninterrupted passage or duct from the opening p, to each side of the vessel. The lower end of the hood P, surrounds the opening p and its upper end is formed with a rearward extension P', which terminates in a down-turned air inlet section that is controlled by a valve P², mounted upon a stem P³, whose lower end extends through a stuffing box P⁴, into the interior of the turret and carries an operating hand wheel at its extreme lower end. P⁵, designates a perforated protecting hood which surrounds the down-turned end of the hood P and the valve P².

Adjacent to the lower end of the ducts O', the walls J, of the turret are formed with openings o^2, o^2, each of which is covered by a U-shaped casting O², secured to the walls and which extend downwardly along the

sides of the plates H, and form therewith a continuation of the ducts O'. Each casting is securely bolted to, and surrounds an opening in the hull of the vessel, and upon the inner side of the hull and arranged over each opening is a box like casting O^3, having an opening which is controlled by a flap valve O^4, operating within the box, and by which the inlet openings to the vessel may be cut off and water prevented from entering the hull should the outer walls or top of the turret adjacent to the ducts be penetrated. The position of the valves is controlled by levers carried at the ends of rock shafts which extend through the castings O^3.

Q, designates a conning tower projecting from the top of the turret near its forward end and in front of the inlet hood P, access to which is had through hatch openings q, q', in the plates forming the top of the turret. The opening q in the lower plate is closed by a dish shaped casting Q', secured to the said plate and has a hatch opening which is closed by a door Q^2. A circular band or collar Q^3, is arranged in the space between the top plates and surrounds the openings q and q' and is sealed to the plates thus preventing ingress of water to the spaces between the several sections of the turret should the tower be injured.

The conning tower is surmounted by a sighting hood R, circular in cross section and having a series of sight openings r, r, which are closed by glass plates r', r', Figs. 6, 7 and 8, that are held in place in any well known manner and their outer surfaces are flush with and of the same curvature as the hood. Contiguous to the openings r, r, the hood is constructed to receive a revoluble band R', consisting of an inner contacting band of felt r^2, and an outer metallic band r^3, whose lower edge is provided with rack teeth r^4, that are engaged by a pinion R^2, held upon the upper end of a shaft R^3, journaled in a bracket projecting from the hood and in a stuffing box held to the inner side of the top of the tower. The lower end of the shaft has a crank handle by which the shaft is operated, see Fig. 6. The band is provided with a series of openings r^5, which may be brought into register with the sight openings as the band is revolved. The purpose of this band is two-fold, namely, first to provide a cleaner for the glass, to clean the mist therefrom which may gather either upon submergence of the vessel or by rain, or by spray in rough weather, and secondly, to provide a closure for any of the openings should the glass become injured or displaced. In practice I may provide the band with one or more vertical metallic cutting strips R^3, Fig. 8, which extends or extend through the felt lining, and which, when the band is moved, will serve the purpose of cutting off any ice or snow which may have collected upon the glass. By revolving the band the glasses covering the openings will be rapidly cleaned and polished.

In the top of the sighting hood R is an opening R^5 which is closed by a cap R^6, the central portion R^7, of which is conical and merges at its base into a circular rim R^8, from the lower side and at the inner edge of which depends an annular flange or collar R^9, whose lower peripheral edge is provided with an interrupted screw thread R^{10}, which is engaged by a similar screw thread formed upon the inner surface of a ring R^{11}, movably held to the under side of the hood R, adjacent to the opening. This ring is preferably held in place by bolts r'', Figs. 6 and 9, screwed into the under side of the top of the hood and extending through slotted openings Fig 9 in the ring.

The peripheral edge of the ring is provided with a segmental rack section s, which is engaged by a pinion R^{12}, carried by a short shaft journaled in a bearing secured to the side of the hood and having a hand wheel at its lower end by which the pinion is operated to revolve the band to engage or disengage the threads of the ring with those of the cap. The lower face of the rim R^8, is provided with a wedge shaped annular flange which engages a suitable packing ring held in a groove formed in the upper face of the hood Fig. 6.

R^{13}, Fig. 6, designates a rib formed integral with and projecting vertically from the top of the cap, the ends of which are enlarged and grooved to fit guide brackets R^{14}, R^{14}, secured to the hood, to prevent the rotation of the hood by the frictional contact of the screw threads of the cap and ring when the ring is revolved. At the upper ends of the brackets are secured stop plates to limit the upward movement of the cap. Depending from the underside of the cap is a headed bolt upon which is swiveled a dish shaped plate R^{15}, having a felt lining r''', as shown.

The purpose of the removable cap R^6 is to permit the look out to obtain a clear view of the horizon without resorting to the use of the sighting instrument U, Fig. 1, or looking through the sight openings r formed in the side of the hood and which will be found particularly advantageous when steering the boat in the night specially when running into a river or harbor or when in the presence of other craft. When running upon the surface the look-out usually obtains his view through the sight openings r, r, but at night it is almost impossible and exceedingly dangerous to properly steer the vessel and when so operating the look out places his head under the plate R^{15} and then revolves the ring R^{11} by means of the hand wheel and pinion until the threads of the cap and ring are disengaged,

then by elevating his body he raises the cap so that he may look out over the top of the hood and by swiveling the plate he is allowed to freely turn his head to look in various directions. When the cap is lowered the ring is revolved in a reverse direction to that for disengaging the threads and the cap is quickly and securely locked in position again with the flange of the rim embedded in the packing ring, thereby sealing the opening and preventing ingress of water when the vessel is submerged.

Access to the turret may be had through a manhole S, Fig. 2 in the top of the turret which is closed by a cover S′, and also through a man-hole S^2, arranged in the hull of the vessel, preferably in alinement with the man-hole S. The manhole S^2, is closed by a cover S^3.

T, T, Figs. 2 and 4, designate dead lights arranged upon each side of the turret at intervals throughout its length and T′, Fig. 6, a dead light arranged in the top of the conning tower.

U designates a sighting instrument projecting through the top of the turret and a casting U′, held between the top plates and which may be used when the vessel is running completely submerged.

The ends of the turret are protected by wooden buffers V which are securely bolted in position and serve to protect the turret should it encounter an obstruction when running submerged. In front of the buffer at the lower forward end of the turret is a beam V′, having a recess into which the end of the gun at the forward end of the turret may rest when not in use. The top of the turret is covered by a wood decking V^2, which is held in place in any suitable manner, the outer edges of which rest upon cleats secured to and adjacent to the upper ends of the side walls J′ of the turret.

From the foregoing it will be seen I provide a vessel well adapted for surface and submarine operations and possessing defensive features which may be employed in warding off attacks from light craft when pursuing the mission assigned to it without resorting to the use of the torpedoes as defensive weapons.

I desire it to be understood that the invention is not limited to the precise structural details herein shown and described since these may be varied without departing from the scope of the invention.

What I claim is:

1. A submarine vessel, having a navigating turret extending from the hull thereof, and having a double walled top and double walled sides, means to divide the spaces between these top and side walls into series of compartments, and flanged end pieces to which the side walls are secured.

2. A submarine vessel, having a navigating turret extending from the hull thereof, and provided with a double walled top and double walled sides divided into a series of air tight compartments and extending throughout the length thereof.

3. A submarine vessel, having a navigating turret extending from the hull thereof, and a series of air tight compartments arranged in the sides and top of the turret.

4. A submarine vessel, having a navigating turret extending from the hull thereof, a series of air tight compartments arranged in the forward and aft ends of the top of the turret, and an air duct constructed in the turret and communicating with the hull of the vessel.

5. A submarine vessel, having a navigating turret extending from the hull thereof, air and water tight compartments arranged in the turret, one of which forms an air duct which communicates with the hull of the vessel, a valve controlled opening leading into the duct, and a valve controlling the inner end of the duct.

6. A submarine vessel, having a navigating turret extending from the hull thereof, air and water tight compartments arranged in the sides and in the top of the turret, one of the said compartments forming an air duct which communicates with the hull of the vessel at each side of the turret, a valve controlled opening extending into the duct, and a valve controlling the inner end of the duct at each side of the turret.

7. A submarine vessel, having a navigating turret projecting from the hull thereof, a series of air and water tight compartments arranged in the sides and top of the turret, one of said compartments forming an air duct which extends to the hull of the vessel, an air inlet hood mounted upon the top of the turret and surrounding an opening in the said turret, a valve controlling the opening, a valve controlling the inlet to the hood, and a valve arranged at the inner end of the duct.

8. A submarine vessel, having a superstructure, a navigating turret extending from the hull of the vessel and projecting above the superstructure, the said turret above the superstructure having double side walls and a double top, air tight compartments formed in the spaces between the side walls and in the top, one of said compartments forming an air duct which extends into the hull of the vessel, a valve controlled opening leading into the duct at the top of the turret, and a valve arranged at the inner end of the duct.

9. A submarine vessel, having a superstructure, a navigating turret extending from the hull of the vessel and projecting above the superstructure and having double side walls and a double top, air tight compartments formed in the spaces between the

walls and in the top, one of said compartments forming an air duct which extends into the hull of the vessel, a valve-controlled opening leading into the duct at the top of the turret, a valve arranged at the inner end of the duct, a conning tower extending from the top of the turret, and a sighting hood mounted on the conning tower.

10. A submarine vessel, having a superstructure, a navigating turret extending from the hull of the vessel, and projecting above the superstructure, the said turret having double walls above the superstructure, and a double top, air tight compartments formed in the spaces between the walls and in the top, one of said compartments forming an air duct which extends to the hull of the vessel, a valve controlled opening in the top of the turret which leads to the air duct, an air inlet hood arranged over the opening, a valve controlling the inlet to the hood, a hollow casting arranged over an opening in each inner wall of the turret and forming continuations of opposite ends of the duct, and each hollow casting extending to and surrounding an opening in the hull of the vessel, valves in said hollow castings controlling the inlets to the vessel, a conning tower arranged above and communicating with the turret, a door for closing the communication, and a sighting hood mounted upon the tower.

11. A submarine vessel, having a superstructure, a navigating turret projecting from the hull of the vessel and extending through the superstructure, the said turret comprising double side walls, a double walled top, and castings forming the ends of the turret and which are connected to the said walls and top, and having sockets therein which are adapted for holding rapid fire guns, and a series of air and water tight compartments formed in the spaces between the walls and in the top.

12. A submarine vessel, having a superstructure, a navigating turret projecting from the hull of the vessel and extending through the superstructure, the said turret comprising inner and outer side walls, inner and outer top plates, and end castings having sockets adapted to be fitted with rapid fire guns, air and water tight compartments formed in the spaces between the walls and in the top, a conning tower mounted upon the turret and communicating therewith through a hatch, a door for the hatch, a sighting hood arranged upon the conning tower and having sight openings and means for closing the openings.

13. A submarine vessel, having a superstructure, a navigating turret projecting from the hull of the vessel and extending through the superstructure, said turret comprising inner and outer side walls, and inner and outer top plates, castings forming the ends of the turret to which the side walls and top sections are connected, air tight compartments formed in the spaces between the side walls and top plates, one of the said compartments providing an air duct which communicates with the hull of the vessel, an air inlet hood upon the turret and surrounding an opening in the top thereof which communicates with the air duct, a valve for the said opening, a valve for the inlet opening of the hood, a conning tower projecting from the turret, a sighting hood arranged upon the tower and having sight openings, a band encircling the sighting hood and adapted for closing the openings, and means for revolving the band.

14. A submarine vessel, having a superstructure, a navigating turret projecting from the hull of the vessel and extending through the superstructure, said turret comprising side walls and top plates, castings connecting the walls and top plates and forming the ends of the turret, air tight compartments formed in the spaces between the walls and top plates, a conning tower mounted above and communicating with the turret, a door for closing the communication, a sighting hood mounted upon the conning tower and having sight openings arranged therein, transparent closures for the openings, a band encircling the hood and having openings which are adapted to register with the sight openings in the hood, and means for revolving the band to cause the openings therein to register with the sight openings.

15. A submarine vessel, comprising a hull, a superstructure, a navigating turret mounted upon the hull and projecting above the superstructure, and having air tight compartments, a conning tower extending from the top of the turret, a sighting hood circular in cross section mounted upon the conning tower and having sight openings, transparent closures for the openings, a band encircling the hood and having openings which are adapted to register with the sight openings, a felted lining connected to the band and engaging the closures for the sight openings, and means operable from within the conning tower for revolving the band for the purpose described.

16. A submarine vessel, comprising a hull, a superstructure, a navigating turret mounted upon the hull and projecting above the superstructure and having air tight compartments, a conning tower extending from the top of the turret, a sighting hood circular in cross section mounted upon the conning tower and having sight openings, transparent closures for the openings, a band encircling the hood and having openings which are adapted to register with the sight openings, a felted lining connected to the band and engaging the closures for the sight openings, means operable from within

the conning tower for revolving the band for the purpose described, a removable cap for closing an opening in the upper end of the hood, and means for locking the cap in position.

17. A submarine vessel, having a navigating turret, a conning tower projecting from the turret, a sighting hood projecting from the conning tower and having an opening in its upper end, a cap for closing the opening and which is adapted to be lifted bodily therefrom so as to provide a space between the top of the hood and the cap to permit free and unobstructed sight from within the hood, means to guide the cap in its bodily movement to and from the hood and prevent its rotation during such movements, and means for locking the cap when in position to close the said opening.

18. A submarine vessel, having a conning tower projecting therefrom and which is provided with a sighting hood having an opening in its top, a cap for closing the opening and a means for locking the cap in position to close the opening air-tight and for releasing the cap so that it may be raised bodily to uncover the opening, means to guide the cap in said movement and prevent it from rotating meanwhile, and means for operating the locking means.

19. A submarine vessel, having a conning tower projecting therefrom and which is provided with a sighting hood having an opening in its top, a cap for closing the opening, a rotatable means for locking the cap in position to close the opening air-tight and for releasing the cap so that it may be raised to uncover the opening, means for operating the locking means, and means for preventing the rotation of the cap when the locking means is operated.

20. A submarine vessel, having a navigating turret, a conning tower having a sighting hood extending from the turret and provided with sight openings and an opening in its upper end, a cap for closing the opening, a collar formed upon the cap and having an interrupter screw thread, a ring revolubly held to the hood and having a complemental screw-thread for engagement with the threads of the cap, and means for revolving the ring to disengage the said threads whereby the cap may be raised to uncover the openings.

21. A submergible vessel, having a navigating turret, a conning tower provided with a sighting hood having sight openings in its vertical wall and an opening in its upper end, a cap for closing the opening in the upper end of the hood, a collar formed upon the cap and having an interrupted screw thread, a ring revolubly held to the hood and having a complemental screw-thread for engagement with the threads of the cap, a plate carried by the cap, rack teeth formed upon the ring, and a pinion engaging the said teeth whereby the ring may be revolved to release the said threads.

22. A submergible vessel, having a navigating turret, a conning tower provided with a sighting hood having sight openings in its vertical wall and an opening in its upper end, a cap for closing the opening in the upper end of the hood, a collar formed upon the cap and having an interrupted screw thread, a ring revolubly held to the hood and having a complemental screw-thread for engagement with the threads of the cap, a plate carried by the cap, rack teeth formed upon the ring and means for preventing the rotation of the cap.

23. A sighting hood for submarine vessels, comprising a body portion having sight openings in its vertical wall and an opening in its upper end, a cap for closing the opening and having a depending flange which fits into the opening and whose lower vertical end is provided with mutilated screw threads, a ring revolubly held to the under side of the hood and having mutilated screw threads for engagement with the threads of the said flange, rack teeth formed upon the ring, a shaft having a pinion at one end for engagement with the said rack teeth and a hand-wheel at its opposite end, a circular rim formed upon the cap, a rib projecting from the top of the cap and the circular rim, and having guides at its vertical ends and guide brackets projecting from the hood and engaging the said guides of the said flange.

24. A sighting hood for submarine vessels, comprising a cylindrical body portion having sight openings in the vertical wall thereof and an opening in its upper end, a band encircling the hood and having openings which are adapted to register with the sight openings, means for revolving the band, a cap for closing the opening in the upper end of the hood, and means for locking the cap over the said opening.

25. A submarine vessel, having a superstructure, a navigating turret extending from the hull of the vessel and projecting above the superstructure, said turret comprising lower side walls which are connected to the hull, a stringer plate connected to the upper edges of the walls and projecting under the superstructure, inner and outer side walls mounted upon the stringer plate, inner and outer top plates, end castings connecting the walls, top plates and stringer plate, the said end castings having sockets which are adapted to receive rapid fire guns, means for closing the openings air and water tight, and air tight compartments formed in the spaces between the walls and the top plates for the purposes set forth.

26. A submarine vessel, having a superstructure, a navigating turret extending

from the hull of the vessel and projecting above the superstructure, said turret comprising lower side walls which are connected to the hull, a stringer plate connected to the upper edges of the walls and projecting under the superstructure, inner and outer side walls mounted upon the stringer plate, inner and outer top plates, end castings connecting the walls, top plates, and stringer plate, the said end castings having sockets which are adapted to receive rapid fire guns, means for closing the openings air tight, air tight compartments formed in the spaces between the walls and the top plates, one of which compartments forms an air duct which extends to the hull of the vessel, and a valve controlled opening formed in the top of the turret and communicating with the air duct.

27. A submarine vessel, having a superstructure, a navigating turret of double conoidal shape in longitudinal horizontal section and projecting from the hull of the vessel, and comprising side walls, top plates and end castings, the said castings having sockets adapted to be fitted with rapid fire guns, and sockets above the gun sockets adapted to be fitted with sighting instruments, means for closing the sockets air and water tight, air tight compartments formed in the spaces between the said walls and the top plates, a hatch in the top of the turret, a closure for the hatch, a hatch in the hull of the turret, a closure for the hatch, a hatch in the hull of the vessel leading into the turret and a closure for same, a conning tower projecting from the turret and a sighting hood mounted upon the tower.

28. A submarine vessel, having a superstructure, a navigating turret of double conoidal shape in longitudinal horizontal section and projecting from the hull of the vessel and comprising side walls, top plates and end castings, the said castings having sockets adapted to be fitted with rapid fire guns, and sockets above the gun sockets adapted to be fitted with sighting instruments, means for closing the sockets air and water tight, air tight compartments formed in the spaces between the said walls and top plates, a hatch in the top of the turret, a closure for the hatch, a hatch in the hull of the vessel leading into the turret, and a closure for same, buffers arranged at the ends of the turret, a conning tower projecting from the turret, and a sighting hood mounted upon the tower.

In testimony whereof I have hereunto set my hand this 30 day of October A. D. 1907.

SIMON LAKE.

Witnesses:
M. D. Blondel,
H. D. Jameson.